

Applicant: Andrew D. Hirzel
Application No: 10/048,128
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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) In a voice coil actuator of the type comprising a coil, an armature, a housing and a magnet, wherein the armature is disposed at least partially within the housing and movable relative thereto and the coil and the magnet are disposed relative to each other so as to induce movement of the armature relative to the housing when the coil is energized by an electrical current, the improvement comprising:

at least one of the coil, the magnet and the housing being nonuniform in orientation relative to the armature, wherein one of the coil and magnet are linearly tapered,

whereby displacement of the armature relative to the housing will be substantially linearly proportional to electrical current flowing through the coil.

2. (Canceled)

3. (Original) The voice coil actuator according to claim 1, wherein the movement of the armature relative to the housing is axial in nature.

4. (Original) The voice coil actuator according to claim 1, wherein the coil is carried by the armature.

5. (Original) The voice coil actuator according to claim 1, wherein the magnet is carried by the armature.

6. (Original) The voice coil actuator according to claim 1, wherein the coil is a single winding.

7. (Canceled)

8. (Original) The voice coil actuator according to claim 1, wherein the housing is tapered.

9. (Original) The voice coil actuator according to claim 1, wherein the magnet is nonuniform.

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10. (Original) The voice coil actuator according to claim 1, wherein the magnet is in the housing.

11. (Original) The voice coil actuator according to claim 1, wherein the magnet is radially contained in the housing.

12. (Canceled)

13. (Canceled)

14. (Original) The voice coil actuator according to claim 1, wherein the coil is arcuately tapered.

15. (Original) The voice coil actuator according to claim 1, wherein the coil is discontinuously tapered.

16. (Original) The voice coil actuator according to claim 1, wherein the magnet is arcuately tapered.

17. (Original) The voice coil actuator according to claim 1, wherein the magnet is discontinuously tapered.

18. (Canceled)

19. (Canceled)

20. (New) In a voice coil actuator of the type comprising a coil, an armature, a housing and a magnet, wherein the armature is disposed at least partially within the housing and movable relative thereto and the coil and the magnet are disposed relative to each other so as to induce movement of the armature relative to the housing when the coil is energized by an electrical current, the improvement comprising:

at least one of the coil, the magnet and the housing being nonuniform in orientation relative to the armature, wherein one of the coil and magnet are parabolically tapered,

whereby displacement of the armature relative to the housing will be substantially linearly proportional to electrical current flowing through the coil.

21. (New) The voice coil actuator according to claim 20, wherein the movement of the armature relative to the housing is axial in nature.

22. (New) The voice coil actuator according to claim 20, wherein the coil is carried by the armature.

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23. (New) The voice coil actuator according to claim 20, wherein the magnet is carried by the armature.
24. (New) The voice coil actuator according to claim 20, wherein the coil is a single winding.
25. (New) The voice coil actuator according to claim 20, wherein the housing is tapered.
26. (New) The voice coil actuator according to claim 20, wherein the magnet is nonuniform.
27. (New) The voice coil actuator according to claim 20, wherein the magnet is in the housing.
28. (New) The voice coil actuator according to claim 20, wherein the magnet is radially contained in the housing.